

Basic Scribing Techniques

A finish carpenter shares his secrets for fitting trim to uneven, unlevel or unplumb surfaces

by Jim Tolpin

The first thing I learned as a finish carpenter was that square corners, plumb walls and level floors and ceilings don't exist on this planet. And because that's just the way it is, it was up to me to learn how to work with these unfortunate divergencies from the way it ought to be. As the finish man, my job was to fit the pretty stuff to the structures that framers and rockers left behind, no matter how crooked they were.

In my quest for perfect fits, I learned how to use bevel squares and base hooks, among other tools, and became proficient in the use of a slightly customized pencil compass. I learned from legendary boat builder Bud Macintosh how to use something called a spiling batten to solve certain awkward scribing problems, such as fitting the last ceiling board. I even paid homage to the linoleum trade and learned the ingeniously simple "Joe Frogger" method of creating a template that can produce dead-accurate fits every time.

Using the bevel square—A bevel square is a layout tool with a wood, metal or plastic body having an adjustable metal blade attached to one end. The square is used mostly for determining the angle at which a piece of trim needs to be cut to fit tightly against a surface.

My first bevel square came from my grandfather. It's a nice rosewood-bodied job with a 6-in. long blade. It's pretty and has sentimental value, but like many contemporary bevel squares, it's not the best tool for taking angles. This is because its locking lever, which is located at the pivot point of the tool, often sticks beyond the edge of the body and gets in the way. Also, the body is quite thick, which holds the blade away from the stock. This can throw off the angle measurement. What's more, the body is relatively short, which can also produce inaccurate readings.

I like my all-metal Japanese bevel square better (bottom left photo, facing page). It's much thinner than a conventional bevel square; the lock is a knurled knob that's out of the way; and it can be held and locked with one hand.

Although the use of a bevel square may seem straightforward, it's not. Always extend the blade fully before pressing the outside edge of the body against a surface to measure an angle (such as when measuring an inside corner where two walls meet). Any protrusion of the blade beyond the outside edge of the body will hold the body away from the surface it's resting against, throwing off the angle reading.

Also, don't assume that you can simply press the square against converging surfaces to get an accurate reading. Say, for instance, that you want to fit a baseboard to a door casing (top photo, facing page). To measure the angle of the end cut, set the baseboard where you want it on the floor, then place the body of your bevel square on top of the baseboard to measure the angle of the casing. If you simply lay the body of the square on the floor, any bumps or dips in the floor next to the joint will fool the square into measuring a false angle. An alternative is to set a level or a straightedge on the floor and to measure the angle off of that.

Once you measure an angle, be careful not to jar the bevel before you scribe the workpiece. Fortunately, there's an easy way to ensure against the loss of an angle setting on a bevel: Record it with the help of a boat-builder's bevel board.

Saving angles—Boat builders, who confront compound angles on nearly every piece they fit, have developed a simple, shop-made accessory that makes it easy to measure and record a series of angles for future reference at the saw table. Called a bevel board, it's a board with a bunch of lines drawn across it at angles ranging from 0° to 45° (bottom left photo, facing page). The bevel board allows you to measure an angle with your bevel square and then read the degrees of the angle directly from the board. If the angle scale on your bandsaw, table saw or chop-saw is calibrated to the bevel board, you need only to set the saw to the appropriate degree mark and cut away. If more than one angle is being taken at once, the angles are simply recorded on a scrap of wood or paper that represents a story board of the piece or pieces to be cut.

The bevel board should be made of a stable wood, such as mahogany or teak, that has an interlocking, split-resistant grain. You can also use a scrap of $\frac{3}{8}$ -in. plywood. Using a protractor, scribe the lines to the board with an awl and then fill them in with an indelible ink. Keep the board thin so that it will be lightweight ($\frac{3}{8}$ -in. thick is sufficient); leave room at both ends of the board for indexing the body of the bevel against it; and radius or chamfer the top edge of the board so that you can orient it at a glance. An alternative board, sans the romance (and not quite as easy to read), is made by scratching the lines deeply into a piece of Lexan plastic.

In lieu of a bevel board, you can scribe and label each angle on a wood block right after you

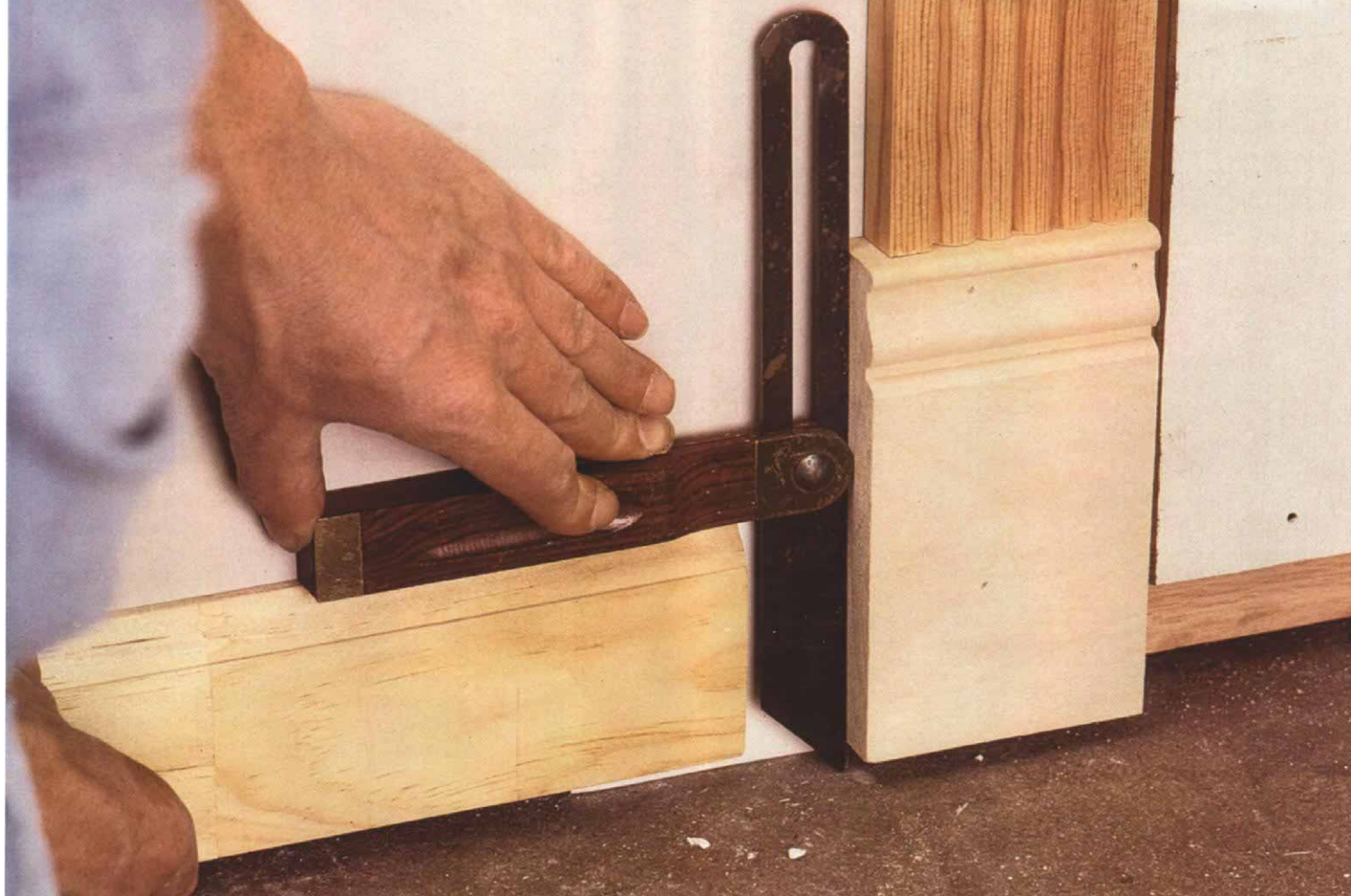
measure it, then reset your bevel square from the block to mark your trim. If you need to quantify an angle in degrees, measure it on the block with a Speed Square.

The base hook—Another homemade tool, called a base hook, eliminates the need for a bevel square in some applications. Similar in concept to a siding gauge (see the cover of *FHB* #47), it's simply an L-shaped piece of a stable, split-resistant wood used primarily for laying out the end cut of baseboard where it butts against standing moldings such as door casings (bottom right photo, facing page). To use the hook, lap it over the baseboard and hold it hard against the standing molding while scribing a cutline across the baseboard. Be sure the faces of your base hook are perfectly square to the edges, or you'll introduce a margin of error.

Scribing to irregular surfaces—Shortly after I became a finish carpenter, I bought a \$5 pencil compass like the kind my kids tote in their school bags. It has two adjustable arms, with a metal feeler point at the end of one arm and a pencil at the end of the other (bottom photo, p. 62). For improved accuracy, I heated and bent out the feeler point of my compass slightly so that the point, rather than a portion of its side, contacts the meeting surface. (The meeting surface is whatever is being scribed to; I'll call the piece to be cut the workpiece.)

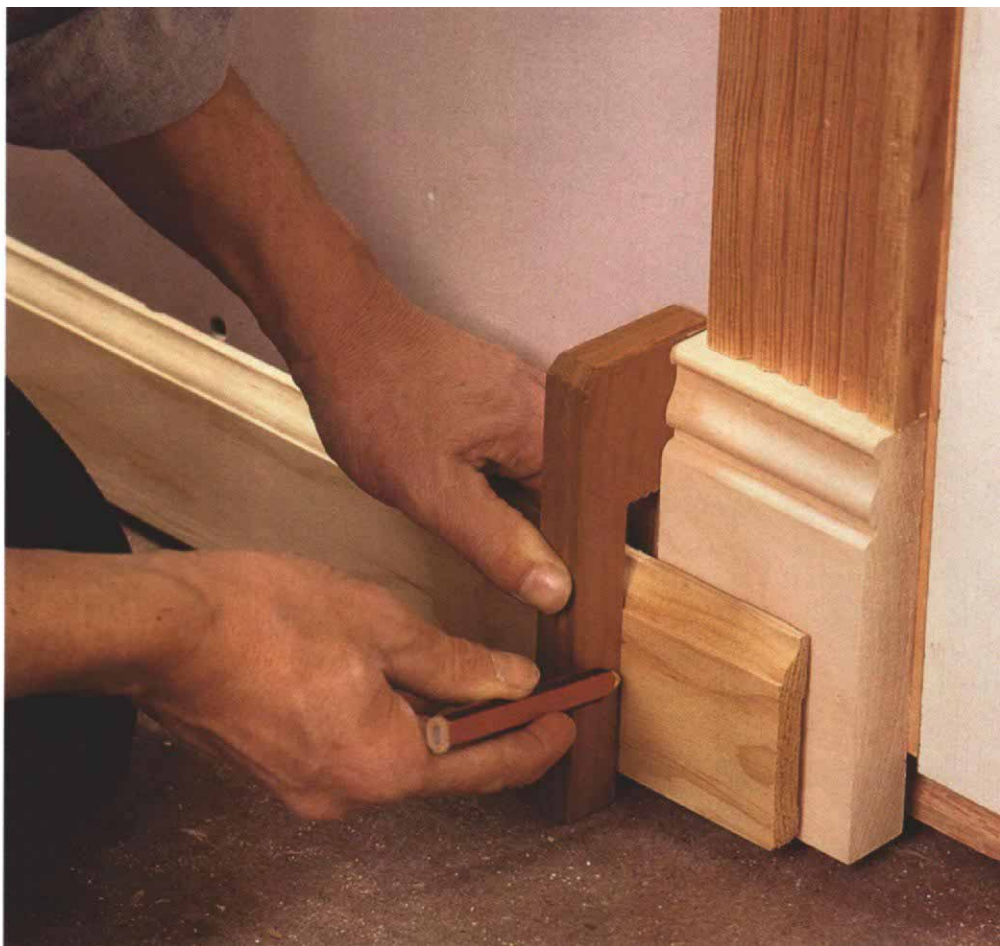
Although I haven't tried it yet, I recently learned a tip from Gary Katz, a contractor in Encino, California. To ensure that he can always scribe a fine line, Katz fits his compass with a Cross #3503 mechanical pencil (A. T. Cross Co./ATX Marketing, One Albion Road, Lincoln, R. I. 02865; 401-333-1200). This pencil is expensive (\$15.50), but it scribes a very fine line, is well made and has a wonderful warranty. No matter how you damage it and regardless of its age, you can return it to Cross, and they'll send you a new one.

When scribing a line with a compass, you are actually transferring the pattern of the meeting surface onto the workpiece. It is very important, as you scribe the line, that the feeler point on one side of the compass not get ahead of or lag behind the pencil point on the other side. Throughout the scribing process, these two points must align parallel to the direction the workpiece will move to contact the meeting surface. If they don't, the result will be an inaccurate pattern and, ultimately, a sloppy fit. (top



Fitting baseboard. Author Jim Tolpin uses either a bevel square (photo above) or a homemade base hook (photo below right) to lay out baseboards for a tight fit against door casings. Bumpy floors can fool a bevel square, so Tolpin always measures the bevel off of a straight-edge or a piece of the baseboard itself. The base hook is used by holding it hard against the casing (or plinth block in this case) while scribing a cutline directly on the baseboard.

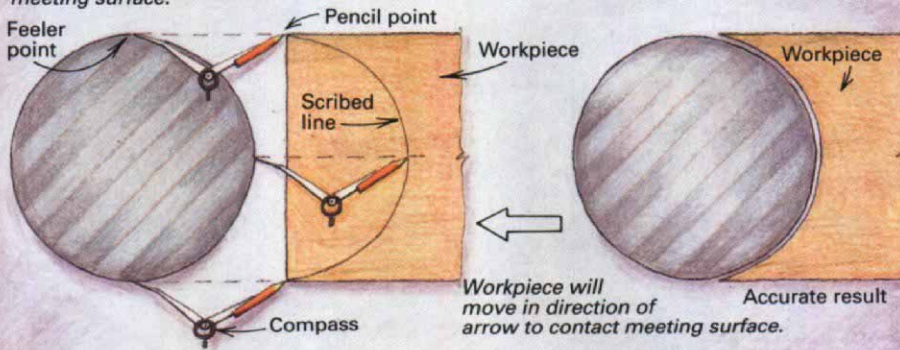
Boat builder's bevel board. Etched with 46 labeled lines spaced 1° apart, the homemade bevel board (photo below) makes it easy to read an angle off a bevel square, then adjust a saw to that angle.



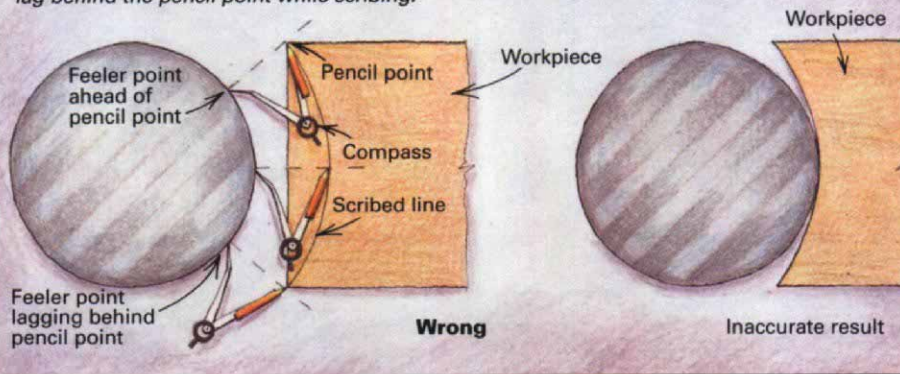
Scribing with a compass

Right

When scribing a line with a compass, an accurate pattern results from keeping the feeler point and the pencil point aligned in the proper direction throughout the process. These points should always align parallel to the direction the workpiece will move to contact the meeting surface.



An inaccurate pattern results from letting the feeler point of the compass get ahead of or lag behind the pencil point while scribing.



drawing, left). Chinkless-log-home builders, who routinely scribe logs to fit together tightly, have developed a homemade compass with an adjustable bubble level on it that makes it easy to keep the compass oriented properly while scribing. For more information about this compass, see *FHB* #53, pp. 80-84.

It's amazing what the pencil compass allows you to do. For instance, it really comes into its own for fitting a wall panel or a vertical siding board to a bumpy surface, such as a fireplace (bottom drawing). The procedure is straightforward. First, plumb the panel or board and tack it to the wall about $\frac{1}{2}$ in. away from the closest spot on the meeting surface. Then set the compass to distance "X" between the edge of the panel and the bottom of the deepest valley on the meeting surface, plus $\frac{1}{4}$ in. so that the scribed line won't fall off the edge of the workpiece. Hold the compass level along the entire vertical run and trace the meeting surface with the feeling point so that the pencil transfers the profile to the workpiece. (If the workpiece is dark, a strip of wide painter's masking tape applied to the panel will make the line more legible.) Finally, remove the workpiece from the wall, back-cut it (bevel it back) a few degrees along the scribed line, then test fit it against the meeting surface. If the fit is good in some areas and way off in others, you probably let the compass wander from level during scribing. If this happens, try again. If necessary, final fitting is achieved through hand planing, sanding, rasping and filing (more on that later).

Sometimes the closing (last) board or panel on a wall must be scribed. This is tougher to do because the board has to fit into an existing gap. For one solution to this problem, see Tom Law's method on the facing page.

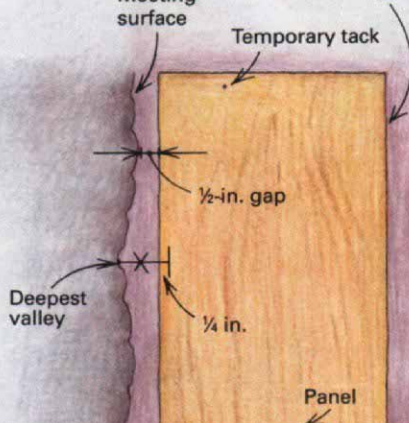
Another common scribing problem is fitting stair treads between a pair of skirtboards (or similarly, closet shelves between two walls). This is accomplished by cutting the tread $\frac{3}{4}$ in. longer than its final length; dropping it into place with one end riding high on a skirtboard; scribing the low end; and cutting the final length of the tread by measuring off the scribed end; dropping the tread back into place with its scribed end riding high; and then scribing and cutting the low end to the measurement mark (for an illustration of this trick, see *FHB* #68, p. 61).

Some fitting jobs are accomplished using a pencil compass in concert with a bevel square and a combination square. Laying out a window stool is a good example (photos p. 62). In this case, use a combination square to locate the outside corners of the window opening (where the wall meets the side jambs); a bevel square to lay out the angles of the side jambs relative to the front edge of the stool; and a compass to scribe the stool horns to the wall. For added convenience, a couple of sticks tacked to the sill (perpendicular to the window) will support the stool while you lay it out.

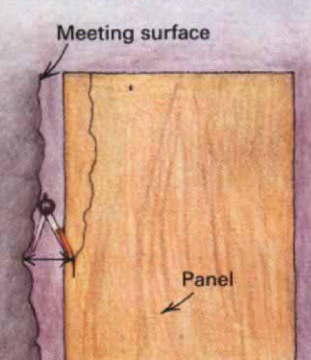
Scribing with a spiling batten—Sometimes it's awkward to hold a workpiece in position for scribing. A perfect example is scribing the closing board of a wood-strip ceiling. Not only do you have to hold up the board while scribing it,

Scribing a panel

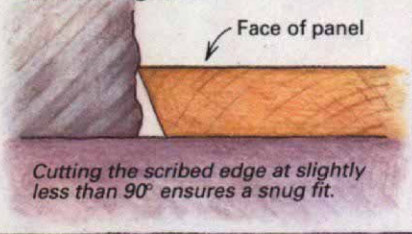
Plumb edge with level.



Scribe panel with compass set to distance "X."



Back-cutting detail



To scribe a wall panel to an uneven surface, plumb the panel and tack it up about $\frac{1}{2}$ in. away from the closest spot on the meeting surface. Then scribe the panel with the compass points set to distance "X" (the distance between the edge of the panel and the bottom of the deepest valley on the meeting surface plus $\frac{1}{4}$ in.). Back-cutting the panel will ensure a snug fit.

Scribing the closing board

by Tom Law

The installation of wainscoting and the installation of vertical siding both have the same problem—fitting the closing (or last) board. I approach this problem by nailing up all but the last few boards. Then I tack up the rest of the boards except for the last one. I mark and cut this closing board, remove the tacked ones, then spring the whole group into place at once and nail them to the wall.

How I fit the closing board depends on the nature of the surface it meets. If the meeting surface is straight and plumb, I

simply measure the gap and rip the board to width. If the meeting surface is straight but not plumb, I measure across the top and bottom of the gap, transfer the measurements to the board, connect the marks with a straight line and rip the board with a circular saw.

If the meeting surface is irregular, the board needs to be scribed as shown in the drawings below. In this case, after I've tacked up the next-to-last board, I mark the top and bottom of its leading edge on the underlying wall (points A and B). Then I

remove all of the tacked-up boards, hold the closing board hard against the meeting surface and mark the top and bottom of its trailing edge on the wall (points C and D).

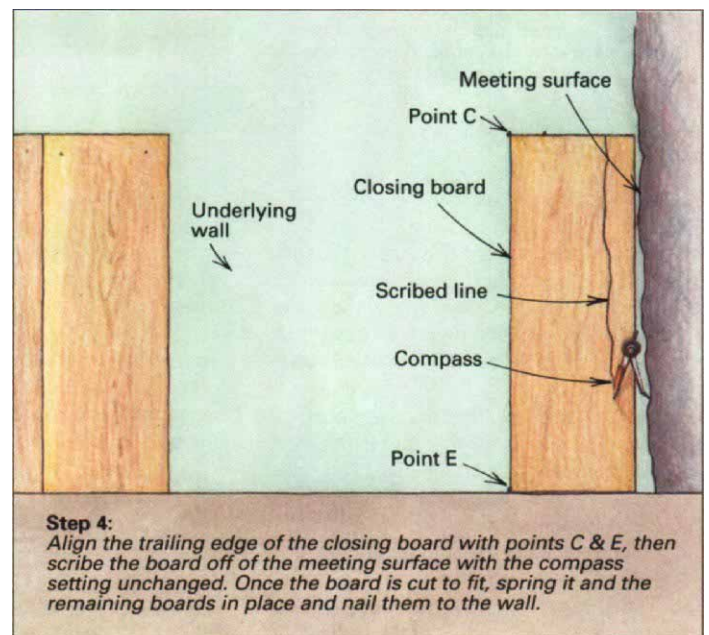
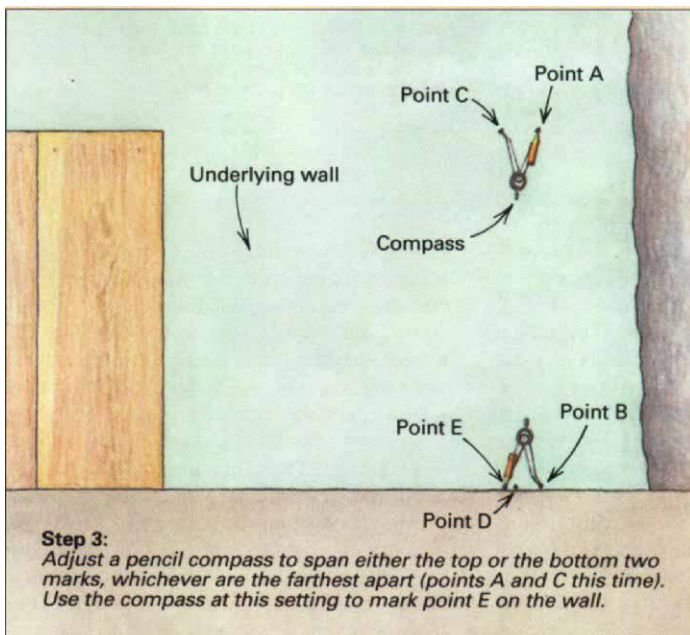
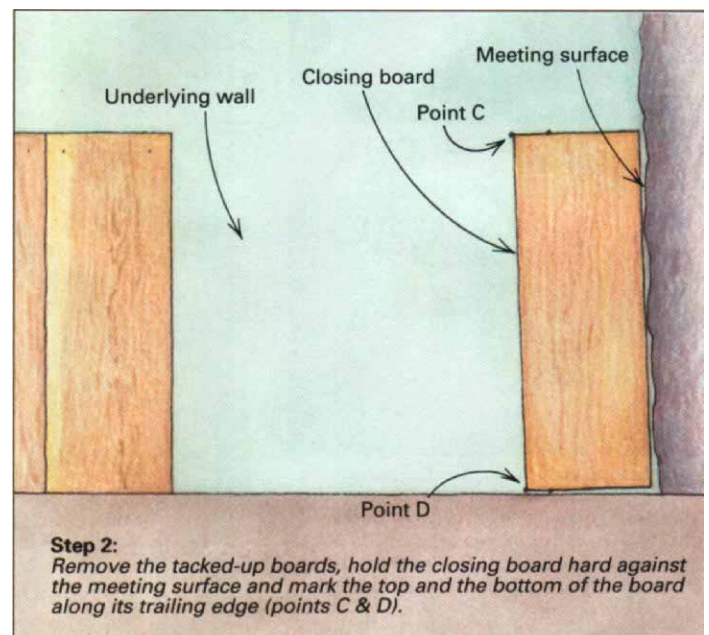
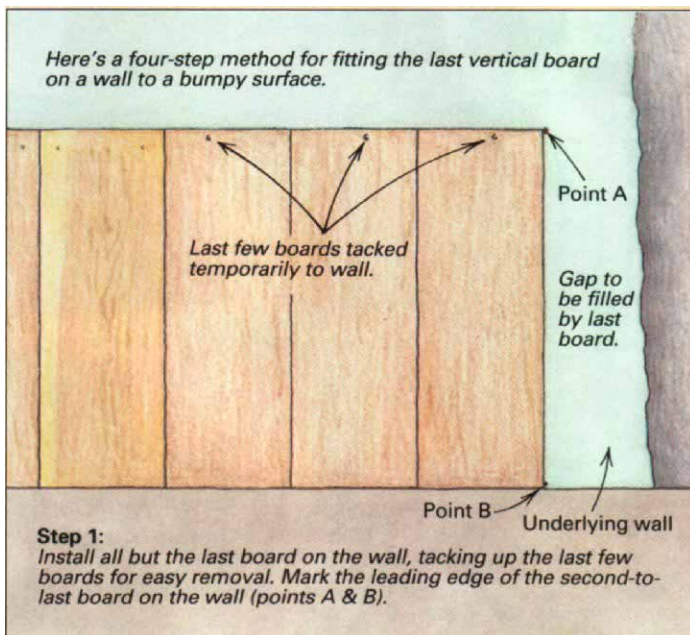
Setting the closing board aside, I now adjust my compass to span either the top or the bottom two marks, whichever are the farthest apart (points A and C in the example). I then use the compass to make a new mark (point E) at the opposite end so that the top and bottom pairs of marks are the same distance apart (if they weren't to begin with). Finally, I replace the closing board so that its trailing edge falls on the appropriate marks (C and E), then use the compass, with its setting

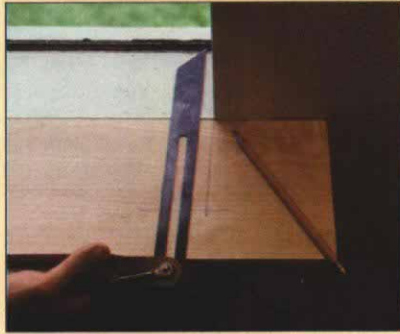
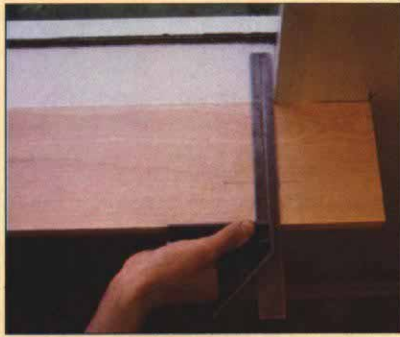
unchanged, to scribe the board to the meeting surface.

I almost always make the cut with a handsaw, cleaning up to the line with a block plane if necessary. A handsaw cuts on the downstroke, ensuring that any tearout will occur on the backside of the board where it won't show. I undercut the board slightly so that when it's sprung into place it makes a nice, neat joint.

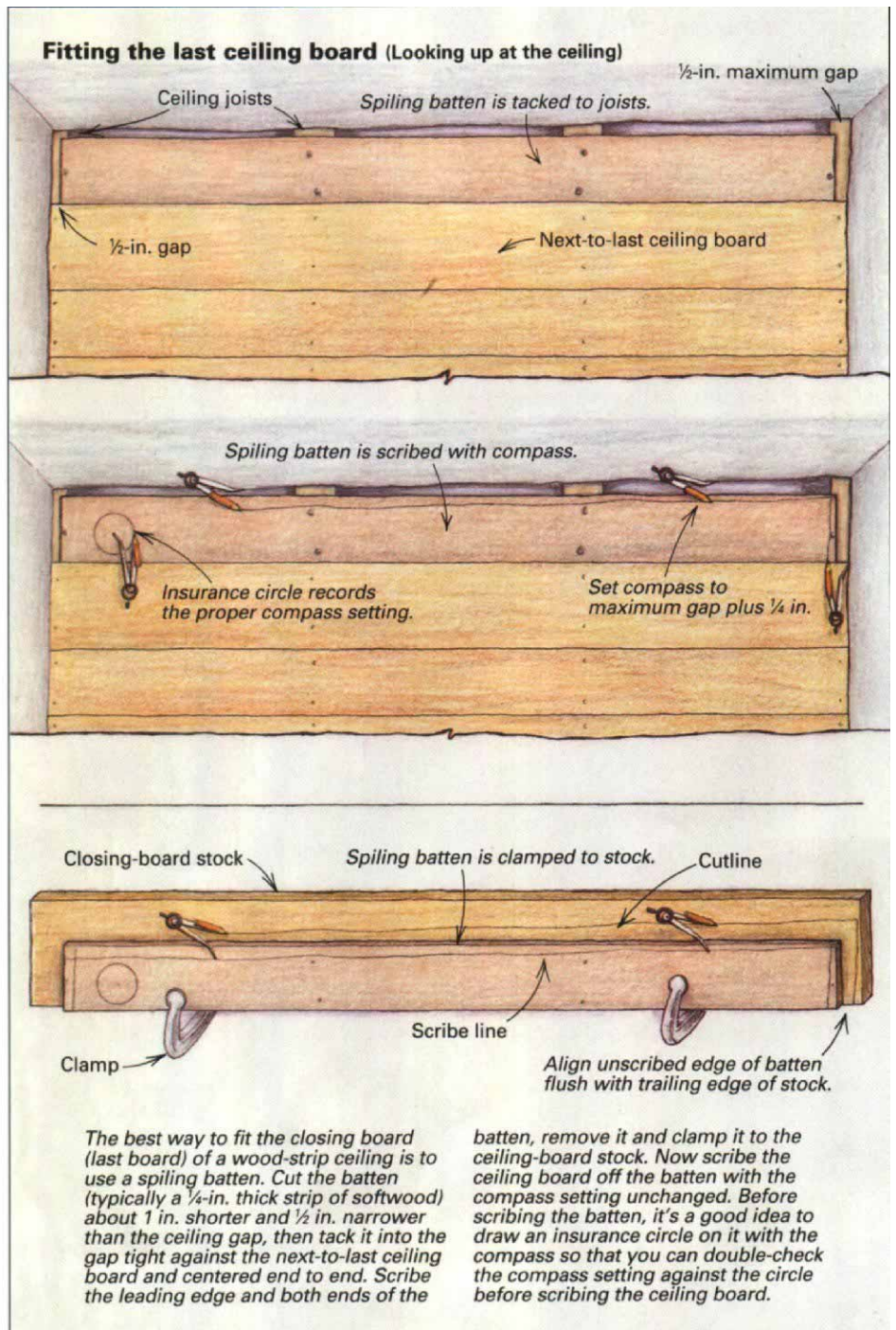
When installing wall paneling instead of boards, only the second-to-last panel is tacked up and removed to fit the last piece. Otherwise, the scribing and cutting procedure is the same.

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Fitting a window stool. The author uses a combination square to mark the outside corner of the window opening on the stool (top photo above). Then he uses a bevel square to measure the angle between the window jamb and the front edge of the stool. This angle is scribed on the stool through the corner point (middle photo above). Finally, he sets his pencil compass to span the distance between the corner of the opening and the corner mark on the stool, then scribes the stool's horn to the wall (bottom photo to above).



The best way to fit the closing board (last board) of a wood-strip ceiling is to use a spiling batten. Cut the batten (typically a 1/4-in. thick strip of softwood) about 1 in. shorter and 1/2 in. narrower than the ceiling gap, then tack it into the gap tight against the next-to-last ceiling board and centered end to end. Scribe the leading edge and both ends of the

batten, remove it and clamp it to the ceiling-board stock. Now scribe the ceiling board off the batten with the compass setting unchanged. Before scribing the batten, it's a good idea to draw an insurance circle on it with the compass so that you can double-check the compass setting against the circle before scribing the ceiling board.

but the oversize board tilts into the opening. This tilt can throw off the scribed line.

Boat builders confront this exact situation when planking a wooden hull, and they've come up with a nifty device to cope with it: the spiling batten. The spiling batten is simply a thin strip of wood (1/4-in. thick softwood is standard) that's tacked into the opening that the last plank (or shutter) will have to fill. The batten is scribed (or spiled, as boat builders would say) to the meeting surfaces along its leading edges and ends, then removed and clamped to the workpiece. The scribe is then reproduced in reverse, from the batten back to the work.

For ceilings, I cut the batten about 1-in. shorter and 1/2-in. narrower than the ceiling gap, then tack it up snug against the next-to-last ceiling

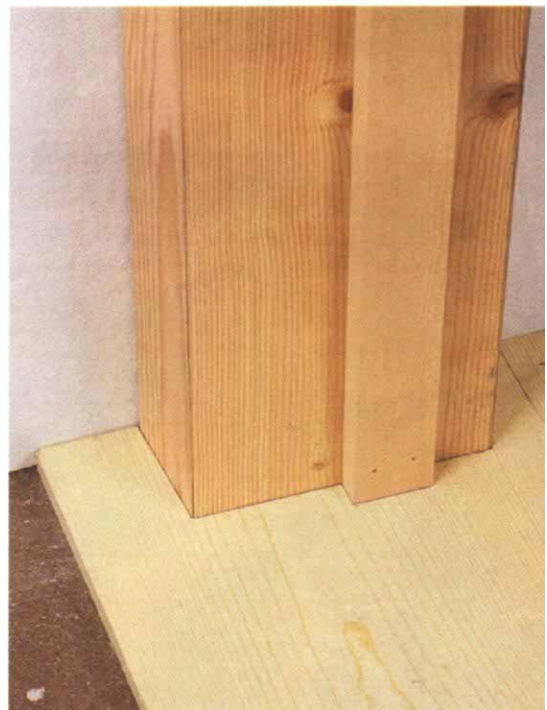
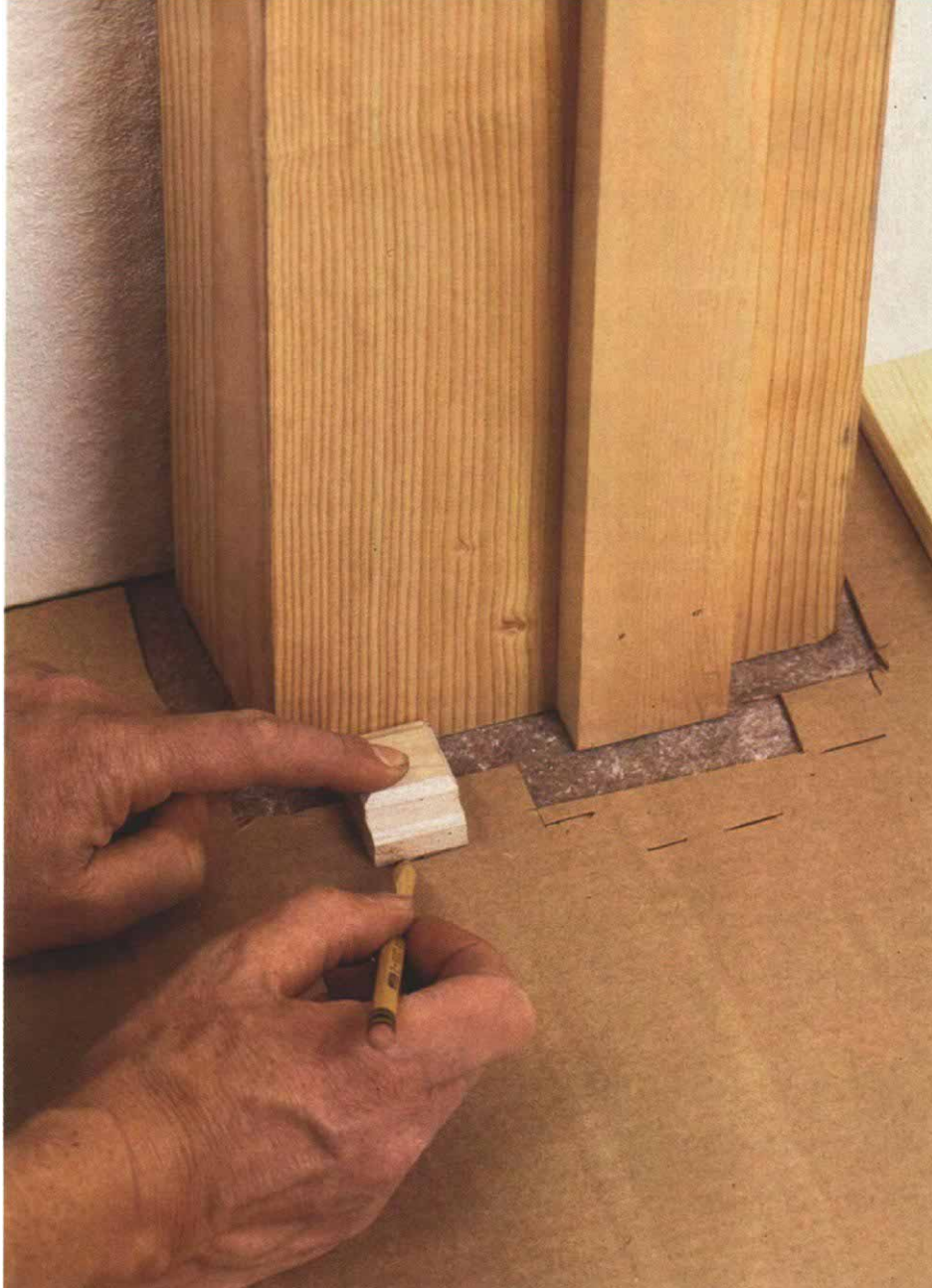
board, spaced 1/2-in. shy of the wall at either end (drawing above). I then set my compass to the maximum gap between the batten and the wall, plus 1/4 in. to make sure that the scribed line doesn't veer off the edge of the batten. Before scribing the batten, I draw a circle on the batten with the compass to serve as a reference if the compass is bumped inadvertently. Once the batten is scribed, I remove it and clamp it to the closing board, positioned with its trailing edge (the edge that meets the second-to-last ceiling board) flush with the trailing edge of the board. The board is then scribed off the batten with the compass setting unchanged (double-checked against the insurance circle on the batten).

I back-cut the ceiling board about 5° to allow the board to swing into place. And this cut makes

it easy to plane the board to fit if necessary.

Fitting floors to posts—The bottom right photo on the facing page shows a wide floorboard that fits tightly around a post. If the post had been square and its faces flat, I would have laid out the floorboard using a combination square. But, of course, the post isn't perfect, and the combination square stayed in the toolbox.

Instead, I called on the Joe Frogger method, as it's known in the linoleum trade, to make a template that works like a spiling batten. You'll need a pencil, a utility knife, a piece of heavy felt paper or noncorrugated cardboard for the template and a small block of wood measuring about 1 1/2 in. square by about 1/2 in. thick (the block is the frog).



Joe Frogger. A trick of the linoleum trade called Joe Frogger makes it easy to fit a floorboard to a post. First, Tolpin cuts a cardboard template to fit around the post and tapes it to the subfloor, tight against the previously installed floorboard. Next, he holds a small block of wood (the frog) against the post in several spots while marking the frog's outside edge on the template (photo above). After removing the template, he tapes it over the next floorboard and uses the frog to transfer each mark from the template to the board (photo above right). The marks are joined using a straightedge and a pencil. The reward is a perfect fit (photo right).

The procedure is simple (photos this page). First, use the utility knife to cut an opening in the template that matches the profile of the post, adding about $\frac{3}{4}$ in. clearance all around. Slip the template around the post, tight against the last installed floor board, and attach it to the subfloor with double-stick tape. Then hold the frog against the post at stations spaced a couple of inches apart while you mark along the outside edge of the frog on the template with a sharp pencil. Rabbits at opposite ends of the frog make it easy to orient the frog in the same way at each station (scribing is always done off a rabbetted edge).

Next, remove the marked template from the subfloor and tape it to the floorboard to be fit, flush with the board's end and trailing edge. Then index a rabbetted end of the frog against

each mark on the template while you mark the opposite end on the floorboard. Finally, join the marks using a pencil and a straightedge, then back-cut slightly along the cutlines. If you're careful, you'll be rewarded with a perfect fit.

Cutting it—Once a workpiece is laid out, there are a number of ways to cut it. Unless the cutlines are relatively straight, allowing the use of a circularsaw, I always use a Bosch 1581VS jigsaw to cut just to the line. The saw blows dust off the cutline, its reciprocating blade cuts fast, and its tilting base allows back-cutting. Besides making it easy to trim stock for a tight fit, back-cutting allows the workpiece to be squeezed into place.

I use a block plane and rasps to remove stock up to the cutline, skewing the block plane to

reach into dips. Fine-tuning is accomplished with flat and round files.

I've worked with a guy who insists that a belt sander is faster and more controllable than a jigsaw for wasting stock to a wiggly line. Another guy uses an angle grinder. Still another scribes with a small bandsaw, which he outfits with a pair of wheels to make it maneuverable on the job site (see Tools & Materials, p. 94). □

Jim Tolpin is a finish carpenter, cabinetmaker and writer in Port Townsend, Wash. His book, Working at Woodworking, is available from The Taunton Press, Inc.; (800) 888-8286. His forthcoming manual on finish carpentry will be published by Craftsman Book Company. Photos by Patrick Cudahy except where noted.